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MCDERMOTT, WILL & EMERY
600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER	
MCDONALD, RODNEY GLENN	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/776,223	MA ET AL.	
	Examiner	Art Unit	
	Rodney G. McDonald	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-14,26,28-40 and 42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-14,26,28-40 and 42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 6-8, 11-14, 26, 28, 29, 31, 32, 35, 37-40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uwazumi et al. (U.S. Pat. 7,067,206) in view of Oka et al. (U.S. Pat. 4,888,211).

Regarding claim 1, Uwazumi et al. teach a method of manufacturing granular magnetic recording media. (See Abstract) Uwazumi et al. teach providing a non-magnetic substrate including a surface. (Column 3 lines 16-18) Uwazumi et al. teach forming a layer stack on the surface of the substrate. The layer stack includes an outermost granular magnetic recording layer. (Column 3 lines 16-21; Column 3 lines

32-41) A protective overcoat layer is formed on the magnetic layer. (Column 3 lines 19-20)

Regarding claim 2, Uwazumi et al. teach forming a layer stack including an outermost granular perpendicular magnetic recording layer. (Column 3 lines 16-21)

Regarding claim 8, Uwazumi et al. teach forming a carbon protective overcoat. (Column 3 lines 53-54)

Regarding claim 11, Uwazumi et al. teach that the substrate can be NiP- plated aluminum or glass. (Column 3 lines 25-27)

Regarding claim 12, Uwazumi et al. teach that the granular magnetic layer can be CoPtCr or CoPt and an oxide of Si, Al, Ti, Ta. (Column 3 lines 42-49)

Regarding claim 13, Uwazumi et al. teach providing a lubricant topcoat layer on the protective overcoat layer. (Column 3 lines 54-55)

Regarding claim 14, Uwazumi et al. teach providing a lubricant of perfluoropolyether material. (Column 3 lines 54-55)

Regarding claim 26, Uwazumi et al. teach a method of manufacturing granular magnetic recording media. (See Abstract) Uwazumi et al. teach providing a non-magnetic substrate including a surface. (Column 3 lines 16-18) Uwazumi et al. teach forming a layer stack on the surface of the substrate. The layer stack includes an outermost granular magnetic recording layer. (Column 3 lines 16-21; Column 3 lines 32-41) A protective overcoat layer is formed on the magnetic layer. (Column 3 lines 19-20)

Regarding claim 29, Uwazumi et al. teach forming a layer stack including an outermost granular perpendicular magnetic recording layer. (Column 3 lines 16-21)

Regarding claim 31, Uwazumi et al. teach that the granular magnetic layer can be CoPtCr or CoPt and an oxide of Si, Al, Ti, Ta. (Column 3 lines 42-49)

Regarding claim 32, Uwazumi et al. teach a method of manufacturing granular magnetic recording media. (See Abstract) Uwazumi et al. teach providing a non-magnetic substrate including a surface. (Column 3 lines 16-18) Uwazumi et al. teach forming a layer stack on the surface of the substrate. The layer stack includes an outermost granular magnetic recording layer. (Column 3 lines 16-21; Column 3 lines 32-41) A protective overcoat layer is formed on the magnetic layer. (Column 3 lines 19-20)

Regarding claim 35, Uwazumi et al. teach forming a layer stack including an outermost granular perpendicular magnetic recording layer. (Column 3 lines 16-21)

The differences between Uwazumi et al. and the present claims is that the magnetic layer having a nano-scale rough and porous surface is not discussed (Claims 1, 26, 32), treating the exposed surface of the granular magnetic recording layer to provide at least one of a reduction in nano-scale roughness and porosity, increased compositional homogeneity, increased microstructural homogeneity, preferential removal of at least one element, and increased grain boundary coverage by a subsequently deposited protective overcoat layer is not discussed (Claim 1), etching the surface of the granular magnetic recording layer is not discussed (Claims 1, 26), the etching comprising sputter etching is not discussed (Claims 1, 26, 32), utilizing inert gas

ions for sputter etching is not discussed (Claims 6, 28, 32), utilizing Ar ions for sputter etching is not discussed (Claim 7), the nano-scale roughness being less than 2.0 angstroms is not discussed (Claims 32, 37, 39) and the nano-scale roughness being less than 1.5 Angstroms is not discussed (Claims 38, 40, 42).

Regarding claims the magnetic layer having a nano-scale rough and porous surface of claims 1, 26, 32, since Uwazumi et al. suggest the same method (i.e. sputter deposition with at least one reactive gas of oxygen) the nano-scale rough and porous surface is believed to be produced. (See Uwazumi et al. discussed above) Furthermore, as shown by Oka et al. a reactive deposition process produces a granular magnetic recording media. (Column 2 lines 32-36; Column 3 lines 53-59; Column 3 lines 66-68; Column 4 lines 1-2) Oka et al. teach providing a non-magnetic substrate including a surface. (Column 6 lines 17-22) Oka et al. teach forming a layer stack on the surface of the substrate, the layer including an outmost granular magnetic recording layer with an exposed nano-scale and porous surface. (Column 3 lines 53-59; Column 5 lines 34-39; Fig. 1)

Regarding treating the exposed surface of the granular magnetic recording layer to provide at least one of a reduction in nano-scale roughness and porosity, increased compositional homogeneity, increased microstructural homogeneity, preferential removal of at least one element, and increased grain boundary coverage by a subsequently deposited protective overcoat layer (Claim 1), Oka et al. teach treating the exposed nano-rough and porous surface of the granular recording layer to provide at least an increased microstructural homogeneity. The treating can include sputter

etching the surface of the magnetic layer with inert gas ions of argon. (Column 11 lines 16-19; Column 11 lines 42-49) A protecting layer can be formed on the treated surface of the granular magnetic recording layer. (Column 12 lines 32-33)

Regarding etching the surface of the granular magnetic recording layer (Claims 1, 26), Oka et al. teach treating can include sputter etching the surface of the magnetic layer with inert gas ions of argon. (Column 11 lines 16-19; Column 11 lines 42-49)

Regarding etching comprising sputter etching (Claims 1, 26, 32), Oka et al. teach treating can include sputter etching the surface of the magnetic layer with inert gas ions of argon. (Column 11 lines 16-19; Column 11 lines 42-49)

Regarding utilizing inert gas ions for sputter etching (Claims 6, 28, 32), Oka et al. teach treating can include sputter etching the surface of the magnetic layer with inert gas ions of argon. (Column 11 lines 16-19; Column 11 lines 42-49)

Regarding utilizing Ar ions for sputter etching (Claim 7), Oka et al. teach treating can include sputter etching the surface of the magnetic layer with inert gas ions of argon. (Column 11 lines 16-19; Column 11 lines 42-49)

Regarding the nano-scale roughness being less than 2.0 angstroms (Claims 32, 37, 39), since the process for producing the magnetic layer is the same as Applicant's process the nanoscale roughness is achieved. (See Uwazumi et al. discussed above)

Regarding the nano-scale roughness being less than 1.5 Angstroms (Claims 38, 40, 42), since the process for producing the magnetic layer is the same as Applicant's process the nanoscale roughness is achieved. (See Uwazumi et al. discussed above)

The motivation for utilizing the features of Oka et al. is that it allows for producing a magnetic recording layer being free from cracks on the surface. (Column 2 lines 35-36)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Uwazumi et al. by utilizing the features of Oka et al. because it allows for producing a magnetic recording layer being free from cracks on the surface.

Claims 3, 30, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uwazumi et al. in view of Oka et al. as applied to claims 1, 2, 6-8, 11-14, 26, 28, 29, 31, 32, 35, 37-40 and 42 above, and further in view of Zou et al. (U.S. Pat. 6,432,563).

Regarding claim 3, 30, 36, Zou et al. teach a granular magnetic layer that is longitudinal for use in magnetic medium. (Column 4 lines 61-68; Column 5 lines 35-47)

The motivation for utilizing the features of Zou et al. is that it allows for producing magnetic layers with increased coercivity and lower noise. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized longitudinal magnetic recording medium as taught by Zou et al. because it allows for producing magnetic layers with increased coercivity and lower noise.

Claims 9, 10, 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uwazumi et al. in view of Oka et al. as applied to claims 1, 2, 6-8, 11-14, 26, 28, 29, 31, 32, 35, 37-40 and 42 above, and further in view of Ono et al. (U.S. Pat. 7,147,943).

The difference not yet discussed is forming a diamond-like carbon protective layer is not discussed (Claims 9, 33) and forming a DLC protective overcoat layer by ion beam deposition is not discussed (Claims 10, 34).

Regarding claims 9, 10, 33, 34, Ono et al. teach forming a DLC protecting layer for a magnetic layer by ion beam deposition (IBD). (Column 8 lines 39-43)

The motivation for utilizing the feature Ono et al. is that it allows for providing a protecting layer that has high bonding force to the lubricating layer. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Ono et al. because it allows for providing a protecting layer that has high bonding force to the lubricating layer.

Response to Arguments

Applicant's arguments filed May 19, 2008 have been fully considered but they are not persuasive.

In response to the argument that Oka teaches away from the claimed sputter deposition of an outermost granular magnetic recording layer, it is argued that Oka while suggesting that sputtering is not sufficient for industrial production Oka do not preclude sputtering for smaller scale operations. As such Oka would not teach away from sputtering on smaller scales. While Oka teaches heating when depositing Applicant's claims do not preclude heating during deposition. While Applicant point out that evaporation is preferred for industrial mass production it is argued that Oka do not preclude sputtering on smaller scale operations. (See Oka discussed above)

In response to the argument that that the Examiner provides basis for reasoning for alleging that Uwazumi teaches Applicant's claimed nanoscale roughness, it is argued that the technical and scientific reasoning for claiming that Uwazumi teach the nanoscale roughness is that Uwazumi teaches the same deposition process and conditions as Applicant requires to deposit a film with nanoscale roughness. Specifically, Uwazumi teaches at Column 3 lines 38-41 reactive sputtering in a sputtering gas of oxygen or nitrogen to produce the film which is what is required by Applicant to produce their film. Oka suggest sputter etching to enhance the fineness of the projections on the substrate. The Examiner considers this to be reducing the roughness of the film. (See Uwazumi and Oka discussed above; Oka Column 11 lines 19-24, lines 42-46)

In response to the argument that the prior art is silent on the roughness being less than 2.0 Angstroms, it is argued as discussed above that Uwazumi teaches the same deposition process and conditions as Applicant requires to deposit a film with nanoscale roughness. Specifically, Uwazumi teaches at Column 3 lines 38-41 reactive sputtering in a sputtering gas of oxygen or nitrogen to produce the film which is what is required by Applicant to produce their film. Oka suggest sputter etching to enhance the fineness of the projections on the substrate. The Examiner considers this to be equivalent to reducing the roughness of the film (i.e. making the film fine). (See Uwazumi and Oka discussed above; Oka Column 11 lines 19-24, lines 42-46)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
June 18, 2008